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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/601,922

06/23/2003

Yaolong Chen

90113

7549

24628

7590

11/23/2007

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EXAMINER

LAZORCIK, JASON L

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

11/23/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/601,922

Applicant(s)

CHEN ET AL.

Examiner

Jason L. Lazorcik

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-14, 17-24, 27-35, 38, 40-53 and 55-64 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-14, 17-24, 27-35, 38, 40-50, 51-53 and 55-64 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

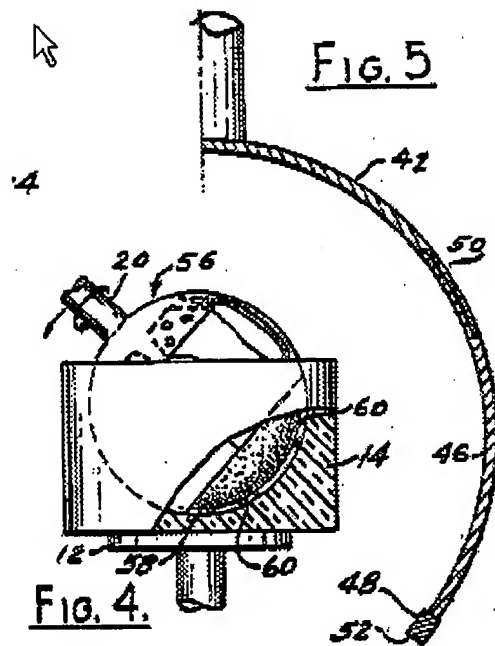
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-10, 12-14, 17-24, 27-35, 38, 40-43, and 45-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lipkins (US 3,088,253) in view of Sakata (US 4,047,469).

Regarding Claims 1-6, 8-10, 12-14, 17-20, 27-30, 41-43, 46-48, Lipkins teaches the production of "a spherical part from a body of fracturable material and at the same time providing a spherical hollow in the body of the material" (Column 1, Lines 8-11) and that the materials of construction of said body include hard, fracturable materials such as quartz (Column 1, Lines 15-18) [**Claim 6**]. Through a single cutting operation, two optical elements are simultaneously produced with one having a generally convex shape and the other presenting a generally concave shape [**Claim 4**]. This process of

producing the spherical cut is accomplished by advancing a spherical or "bell shaped" carrier with a diamond edged on the circumference or periphery thereof through the body material. Both the receptacle supporting the body material and the cutter are rotated about respective axes [**Claims 2,3, 9,10, 13, 14**] or "a rotating axis which passes through a center point" while the cutter is further swung gradually through an angle to increase its penetration into the body" (Column 1, Lines 41-48). Since both optically transparent pieces resulting from the cut have curved surfaces, they are inherently understood to perform in the capacity of a lens or optical element [**Claim 5**].

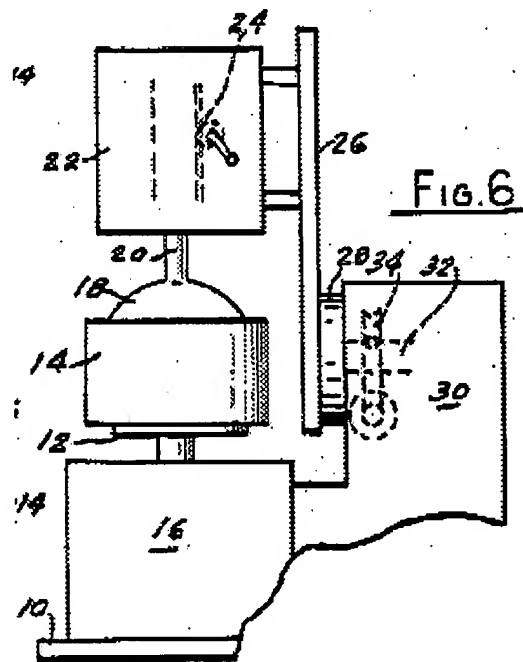
Regarding **claim 12** and as discussed in the previous Official Action dated April 18, 2007, the spherical carrier disclosed in the Lipkin document is broadly understood as being in "the form of a bell" or a "part-spherical shell" [**Claim 17**]. Further, as depicted in the instant reference figure 4 below, the separating body is pivotable about a pivoting axis corresponding to the curvature of the separating cut to be introduced into the basic body. Further, Lipkin indicates that the diamond-edged cutter with a spherical carrier has "approximately the same radius as the desired cut" (Column 1, Line 43-44). Provision of an analogous pivoting movement for the basic body would have represented a merely trivial modification in view of the Lipkin disclosure.



Regarding **Claim 7**, Lipkins did not teach producing lenses from calcium fluoride, barium chloride, magnesium fluoride or lithium fluoride. Lipkins only mentioned fused quartz, silicon and germanium by name. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the method of Lipkins to make lenses from the claimed materials because those are frangible materials which are very similar to fused quartz, silicon and germanium and a person of skill in the art at the time the invention was made would have expected the similar materials to react similarly in a cutting method.

Regarding **Claim 17**, it is also clear from the above excerpt from Lipkin that the spherical carrier provides a bore in which the but body can be accommodated and which is supported on its outer circumferential wall (42) by a holding device and the cutting elements (48, 52) are arranged on the inner circumference of the shell.

Claims 18 through 20 are rendered obvious from the device depicted in the instant reference Figure 6 where a clamping device secures the shaft (20) of the spherical carrier in what is broadly interpreted as a "cylindrical housing". It is further noted that this mechanical arrangement is routinely utilized in commercially available drill press devices and would have been an obvious mechanical interconnect for one of ordinary skill.



Regarding Claims 27-30, Lipkin teaches that the inner part of the body being cut (e.g. the convex surface) can be supported by an adherent support, similar to the support of the body itself, where there is no interference between the cutter and the support." (Column 1, Line 70 to Column 2, Line 3, and column 4, Lines 8-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize any adhesion means appropriate including pneumatic, mechanical, hydraulic, or magnetic to secure the separate pieces of the body as described. Further, since the

body receptacle is provided with a rotational driving force, it would be necessary and obvious to one of ordinary skill in the art to provide the upper receptacle with a "follower device" in order to avoid generating stress at the interface between the cutting surface and the body during a cutting operation. This follower device and body receptacle will naturally be rotationally displaced in the direction of the rotating axis which passes through the pivoting point during a normal cutting operation as disclosed above. Finally, since both the upper and lower segments of the body are secured to receptacles as disclosed above, it would be obvious to maintain both pieces of the body under a nominal tensile stress during the cutting operation in order to insure that the spherical cutting body is not placed under an undue compressive force which could increase the frictional wear upon the cutting body.

With respect to Claims 32 –35, 37, and 40, 55, Lipkins teaches (See figures 2,3, and 5) a separating body divided into 2 or more parts which upon assembly provide pass through depressions, bores, or grooves which penetrate the thickness of the wall of the spherical carrier or the circumferential wall. The grooves are integral with or "fluidly connected" to the cutting elements.

Regarding Claim 38, 49, Lipkin indicates that the spherical cutter has a "cutting edge of diamond dust imbedded in a suitable metal carrier". Where the diamond dust particles are understood as the cutting elements, the cutting elements are understood to be irregularly arranged on the separating body or the spherical carrier (Column 2, Line 67-69).

Applicants previous amendments for Claims 1 and dependents, Claim 8 and dependents, previously presented Claims 21-24, 31, 45, and 50, and claims 51-53, 55, 56-58, and 59-64 all set forth limitations drawn to a vibration damping feature incorporated into the method or the device for producing optical elements. Since Applicants amendments present a spectrum of subtle permutations upon this particular limitation which vary both in scope and content, they will here be summarized by the Examiner.

Claims 1 and 8 drawn to the method require "placing a mechanical vibration damping element on the circumference of a separating body and adjusting its radial position to lessen vibration". Claims 63 and 64 broaden the scope of the method claims 1 and 8 by requiring only "a vibration damping element" instead of the "*mechanical* vibration damping element" of the prior claims. Similarly, new claims 59-61 drawn to the device require a general vibration damping element or "placing a vibration damping element on the circumference of a separating body and adjusting its radial position to lessen vibration".

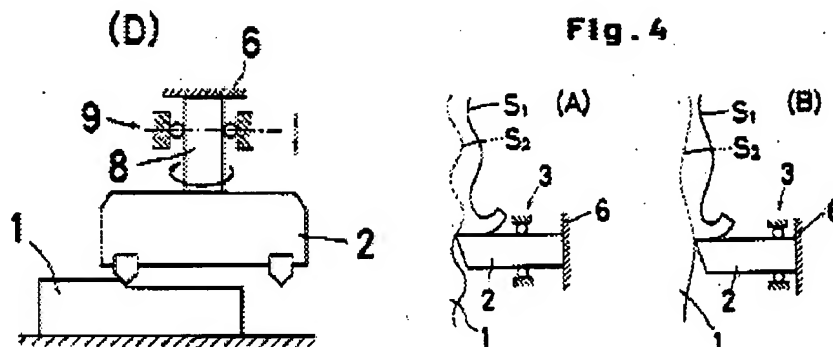
Claim 31 broadly requires that "the separating body has a vibration-damping construction, while Claims 45 and 50 require "providing a vibration damping to said separating body". Claim 55 requires that the separating body "has a mechanical damping elements", Claim 56-58 require that "a moving damping element is on the circumference of the separating body, and Claim 62 requires "a mechanical movable damping element is on the circumference of the separating body".

Claims 21-24 variously require placing damping elements on a cylindrical housing, or integrating the damping element into, or connecting the damping to one or both sides of the part-spherical shell. Claim 51 combines limitations drawn from Claims 21-24 in addition to the requirement that the mechanical damping element be displaceable in the radial direction of said partial-spherical shell. Claim 52 further limits claim 51 by requiring that the mechanical damping elements be displaceable under open or closed-loop control.

As set forth in the previous Office Actions dated April 18, 2007 and October 26, 2006, Lipkins (US 3,088,253) is silent regarding the inclusion of a damping element with the disclosed cutting device. Sakata (US 4,047,469) teaches a method and device for suppressing "self-excited chatter vibrations" in a rotating tool.

The Sakata reference begins by indicating that when a bit is not stable during a workpiece cutting operation, machine vibrations cause "the surface of the workpiece thus machined (to become) sinusoidal" and that a different sinusoidal pattern is realized on each substrate for each machining operation (Column 1, lines 5-50). Sakata continues by teaching that "continuously sliding and reciprocating the chatter suppressing mass on the tool or on the tool spindle to shift the contact pressure" alters that natural frequency of the tool system during machining and suppresses the chatter vibrations (Column 1, lines 53-67). Stated alternately, Sakata teaches that "as the auxiliary holder moves to-and-fro on the tool, the rigidity of the workpiece accordingly varies with the result that successive sinusoidal waves have a different phase from each

other, thus finally suppressing the self-excited chatter vibration in the tool system.”  
(Column 4, Lines 18-27).



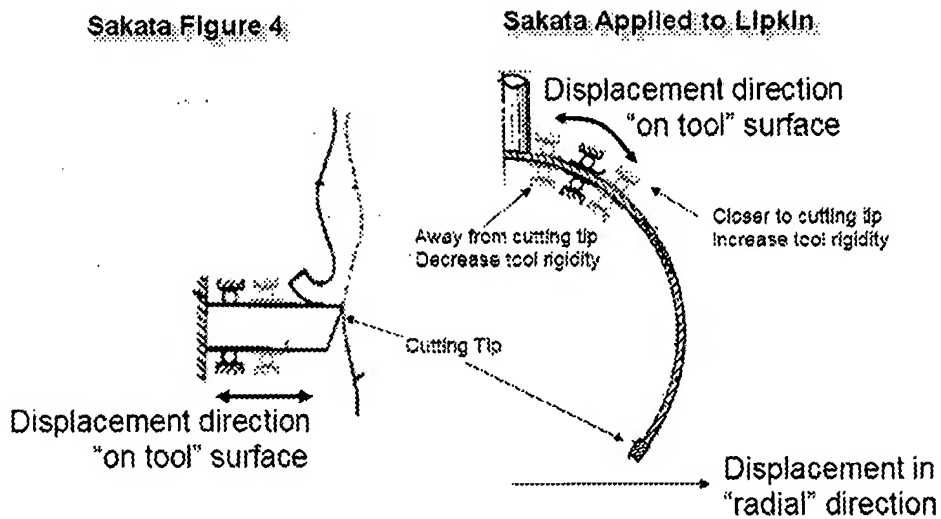
A diagrammatic representation of the Sakata chatter suppressing device or “mechanical movable vibration damping element” located upon the spindle of the tool (2) is depicted in the figure 5(d) excerpt above. Similarly, the excerpt figure 4 depicts reciprocation of the vibration dampening element directly upon the tool surface (2) itself.

Sakata specifically does not limit the type of tooling for which the instant device is applicable (Column 3, lines 58-61), rather the reference indicates that the method and apparatus “can be equally applied to lathes, planers, shapers, drilling machines, milling machines, grinders, boring machines and other machine tools for the purpose of suppressing the self-excited chatter vibration”.

The inventive device is shown in figure 5(d) with particular application to a rotating part-spherical tool of the general type taught in the Lipkin '253 patent. In view of the Sakata disclosure, it would have been obvious to one of ordinary skill in the art to

incorporate the reciprocating vibration dampening element of Sakata into the Lipkin apparatus as a means to reduce or eliminate vibrational chatter. The Sakata vibration damping element would have been an obvious modification to the Lipkin apparatus for anyone seeking optimize the quality of an as cut optical element by suppressing vibration induced sinusoidal surface waves. In addition, although Sakata places no particular limitation upon the drive element for the disclosed vibration suppression element, it is the Examiners position that a feedback control device would have been a mere obvious extension over the prior art of record.

Further, it is important to underscore the point that Sakata disclosure provides for the vibration suppression incorporated either directly "on the tool or on the tool spindle" as indicated above. Incorporating the Sakata dampeners upon the arcuate surface of the Lipkin part-spherical tool in the manner suggested by Sakata would naturally result in the claimed "radial displacement" of the damping elements. Specifically with reference to the Sakata reference figure 4 (see above excerpt), Sakata teaches displacing the damping mass closer to the cutting tip in order to increase the rigidity of the tool and conversely to displace the mass away from the cutting tip to decrease the tool rigidity. Application of this principle to the Lipkin tool is depicted in the following (see below) composite image derived from the two teachings. Displacement of the damping element in the radial direction would naturally flow from combined Sakata/Lipkin teachings for use of dampening elements directly upon the Lipkin tool surface.



**Claim 39** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lipkins (US 3,088,253) and Sakata (US 4,047,469) as applied to claim 12 above, and further in view of Lipkins (US 3,159,952).

The combined prior art did not teach wedge-shaped cutting elements. Lipkins '952 taught the use of wedge shaped cross-section cutting elements (see figures 5-7 and col. 3, line 71 to col. 4, line 64). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a cutting element from Lipkins '952 in the cutting element of prior art because Lipkins '952 taught that it would have helped produce a continuous spherical surface at the final point of breaking of the inside part from the outside part of the material.

### ***Response to Arguments***

Applicant's arguments filed September 20, 2007 have been fully considered but they are not persuasive.

Applicant specifically argues that the Sakata reference only teaches the axial displacement of dampening elements and is therefore not applicable to the claimed method which requires an axial displacement of dampening elements. Applicants arguments and claim amendments have been carefully considered, however said arguments are not deemed persuasive.

As set forth in greater detail above, Sakata teaches that the disclosed damping elements may be either displaceable along the spindle support for a tool or displaceable directly upon the surface of the tool itself. The reference further teaches that the elements should be displaceable in a direction along the tool surface nearer to and farther away from the cutting tip in order to control the tool rigidity. Finally, while the Sakata presents several representative embodiments for the vibration damping invention, the reference specifically indicates that the damping principles "can be equally applied" to other tool geometries.

Therefore as discussed above, one of ordinary skill in the art would be motivated to incorporate the Sakata damping elements into the Lipkin cutting tool in order to increase the quality of the glass cut surface by decreasing tool vibrational chatter. By virtue of the arcuate shape of the Lipkin cutting tool, an Application of the vibrational damping elements directly upon the tool surface as taught by Sakata would naturally result in the claimed radial displacement of the damping elements.

With respect to the rejection of claim 12, Applicant argues the cut provided in the Lipkin reference does not yield the claimed "at least two optical blanks for lenses". Applicant here appears to argue an intended use for the cut glass material resulting from the Lipkin process. In response to Applicant's argument that the Lipkin cut glass is not materially equivalent to the claimed "optical blanks for lenses", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

With respect to claims 45 and 49, Applicant argues that an arrangement of diamond dust particles on an edge of a cutting tool does not adequately read upon the claimed irregular arrangement of cutting elements. Although Applicant apparently acknowledges that a single diamond dust particle may be properly construed as an individual cutting element, Applicant argues that by grouping individual dust particles along an edge they are no longer considered irregularly arranged upon the separating body. It is the Examiners position that such an argument is fatally flawed on its face.

Specifically, the mere act of grouping dust particles in a particular location (e.g. along an edge of a tool) in no manner suggests or necessitates that the individual particles are positioned with a regular arrangement. Specifically, Applicant has provided no reasoned basis or evidence rebut the Examiners position that the prior art dust are positioned along the tool edge in a random or "irregular" arrangement.

Therefore in the absence of compelling evidence to the contrary, Applicants arguments on this point are deemed moot.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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JLL

  
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